



Hydrogen
Hamburg

Renewable Energy Hamburg

Hydrogen economy in the Hamburg Metropolitan Region

—
Insights into projects and stakeholders





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Dear Readers,

More than ever, the future of the renewable energy industry is linked to the welfare and interest of society. If we are to curb climate change, the emission of greenhouse gases must be reduced. To do this, we need to first and foremost replace fossil fuels with eco-friendly alternatives. Today, renewables are among the most important, most promising AND MOST AFFORDABLE sources of electricity. A strong expansion of renewables alongside enhanced sector coupling and the development of a hydrogen infrastructure are key elements of the energy transition and contribute greatly to meeting our climate goals.

And the figures speak for themselves: thanks to the expansion of sustainable technologies for the generation of electricity, the share of renewable sources in the electricity mix has increased to over 40 % within 20 years.

Alongside the restructuring of the electricity sector, the systematic use of hydrogen in industry and logistics is the most powerful lever for climate protection as it helps secure and create jobs in industry. What is more, early technological leadership in this field offers additional business opportunities in export markets. Thanks to its unique mix of locational advantages, the Hamburg Metropolitan Region can play a decisive role in ramping up the hydrogen market and become a blueprint for other cities and countries. The Renewable Energy Hamburg (EEHH) Cluster Agency actively supports stakeholders from business and politics along this path.

As a key regional industry network for energy systems of the future, we offer ideal networking opportunities and a wealth of information in the specialist areas of wind energy, solar energy, heat and sector coupling as well as the hydrogen economy. Through expertise and innovation, we aim to achieve an even higher share of renewable energies. If you would like to support the growth of our network and help us realise pioneering energy projects, please get in touch with us – we look forward to hearing from you!

With best wishes,

Dipl.-Ing. Jan Rispens
Managing Director
Renewable Energy Hamburg Cluster



*Dipl.-Ing. Jan Rispens,
Managing Director EEHH*

” *In the context of the energy transition, hydrogen is more like sauerkraut than champagne: it makes green electricity preservable so it can be used in the energy system irrespective of time and place.* **“**



Hydrogen as the
energy source of the future

Since it was founded eleven years ago, the Renewable Energy Hamburg (EEHH) Cluster Agency has played a key role in shaping the transformation of the renewable energy sector in the Hamburg Metropolitan Region.

Hamburg is at the centre of this process and is now considered the unofficial wind capital of Europe, with many head offices of turbine manufacturers and project developers in the area. Today, the region provides a template for large-scale electricity supplies from renewable sources and is now facing the energy transition's next major challenge: the decarbonisation of industry as well as successful sector coupling as part of a targeted heat and transport systems reform – vital elements in accomplishing an all-embracing transformation.

HAMBURG'S CLUSTER POLICY

The EEHH cluster supports the regional economy in this fundamental system transformation, and hydrogen has been a core theme in the cluster's activities since 2021. Hydrogen has the capacity to store green energy, and the fields of application are diverse, ranging from industrial processes to use as a fuel in port and ship logistics, in aviation, heavy goods transport and local public transport to heat supply. Hydrogen bridges the gap between different sectors of the economy, and as the value chain is being developed, a great deal of coordination is required between production, transport, distribution and purchase. Here, those involved can benefit from EEHH's core competence of identifying interfaces and connecting relevant partners. As the hydrogen market is being ramped up, EEHH supports its members and important stakeholders from the realms of politics and business through advice, location marketing as well as exchange and networking with other companies, regions and countries.

INDUSTRY IN A STATE OF CHANGE

Hamburg's policy-makers have set out to make the Hamburg Metropolitan Region a pioneer in the hydrogen economy, and they are supported in this by national and Northern German hydrogen strategies. These aim at establishing an exemplary green hydrogen economy that has the capacity to supply all interested large-scale consumers. The advantages are obvious – not only in terms of climate protection through decarbonisation of transport and industry, but also in terms of competitiveness and future value creation.

ABOUT RENEWABLE ENERGY HAMBURG (EEHH)

The Renewable Energy Hamburg (EEHH) Cluster comprises over 220 companies in the Hamburg Metropolitan Region from the fields of finance, research, production, project development and legal counsel. As an industry network, EEHH offers a joint platform for stakeholders from business, science and politics.

*Hydrogen and fuel
cell technology for a
sustainable future*



**WASSERSTOFF-GESELLSCHAFT
HAMBURG E.V.**



© Thies Ibold



GETTING INVOLVED

Since summer 2021, our community manager Kirsten Schümer has been bringing the professional community together with a number of new event formats, and member companies are warmly invited to get involved.

If you are interested in becoming a member, if you have any questions regarding our trade events, working and project groups or if you would like to learn more about our services and terms, please don't hesitate to get in touch with us.

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TRADE FORUMS AND EVENTS

To promote professional exchange and networking, the EEHH cluster offers regular forums on financing & law, heat, solar energy, and media. In mid-2021, a hydrogen forum was added to the list. In addition to exchange rounds on strategy calls, H₂ technology and H₂ projects, EEHH members also meet up as part of regulatory working groups. At such meetings, participants explore and discuss thematic and business-related interfaces, which often leads to new projects and long-term business relationships. Collaborations within these forums also result in joint products such as guidelines, recommendations for action and position papers as valuable input for political decision-makers.

Beyond these forums, EEHH also offers its members networking events of various formats, such as “Gröönschnack un lopen”, a walk & talk format, “Grünes Wasserstoff-Sofa” (Green Hydrogen Sofa), a casual monthly gathering, as well as meet-and-greet receptions for existing and new members, and much more.

SERVICES PROVIDED BY EEHH

NETWORKING:

- Face-to-face events
- Digital events
- Trade forums
- Excursions
- Delegation trips

MARKETING:

- Blog
- Social media
- Media and public relations
- Online newsletter (DE/EN)
- Podcast
- Job board
- Web services





Green money for green energy

Renewable energies are one of the most important levers for mitigating climate change and a fundamental part of our lending business. Whether you are planning to construct a wind turbine or realise a photovoltaic project: we are your partner. And this also applies to local heating, storage and sector coupling projects.

Learn more at gls.de/finanzieren



Problems don't evaporate. But they can turn into hydrogen.

With currently more than 30 hydrogen projects, we are committed to mastering the technological transformation of society. To accomplish this, we provide everything under one roof: production know-how, storage capacity, and expertise in trading. As one of the world's largest electricity producers from renewables, we supply green electricity required for the production of hydrogen. We have the passion, and we have a clear goal: climate neutrality by 2040.



Hamburg is leading the way

The steam reforming process, the traditional method used to produce hydrogen from natural gas, releases CO₂, which is referred to as grey hydrogen. In the Hamburg Metropolitan Region, we have the great advantage of being able to produce green hydrogen in a climate-neutral way by using wind power.

Learn more about
Hamburg's hydrogen
economy in this video.



MODEL REGION WITH LOCATIONAL ADVANTAGES

The Hamburg Metropolitan Region's great advantage is its high concentration of green hydrogen producers and consumers alike. The geographical proximity to the coastal regions of the North and Baltic seas, which are strong in terms of wind power, allows energy to be transported by power lines in a way that serves the system without major losses. And in the industrial and port city of Hamburg, many consumers are situated closely together, while the city's port infrastructure provides the relevant prerequisites for future import capacities. When considering the planned pipeline connection to the European Hydrogen Backbone too, Hamburg has all it takes to become a hydrogen hub.

RAMPING UP THE MARKET: CHALLENGES ALONG THE PATH

Despite such favourable conditions and promising prospects, establishing a functioning hydrogen economy involves enormous efforts for Hamburg as an industrial location. Large additional volumes of green power will be needed for electrolysis, which is why the further expansion of renewables is a top priority. Moreover, companies are required to develop relevant infrastructure and new business models, and questions of societal approval play an important role in this regard. In addition, policy-makers at both federal and EU levels will have to adapt their regulatory frameworks in order to create incentives for investment and ensure economic viability in the long run. Policy instruments such as an increased carbon tax, Carbon Contracts for Difference and quotas in public procurement can help decrease investment and production costs for hydrogen, while at the same time making the continued use of fossil raw materials less profitable. Following the successful completion of pilot projects, the scaling-up process needs to be mastered, import capacities need to be created and skilled professionals with matching expertise need to be recruited and trained.





H₂



Hydrogen is now.

Together we are making the energy transition possible – with green hydrogen generated by H-TEC SYSTEMS.



PEM-Elektrolyser
ME100/350

- Our compact entry-level model
- Nominal load: 225 kW
- Hydrogen produced: 100 kg/d



PEM- Elektrolyser
ME450/1400

- Our scalable turnkey solution
- Nominal load: 1MW
- Hydrogen produced: 450 kg/d



Benefit from compact technology, high power density and low operating costs in the industrial use of hydrogen.

h-tec.com



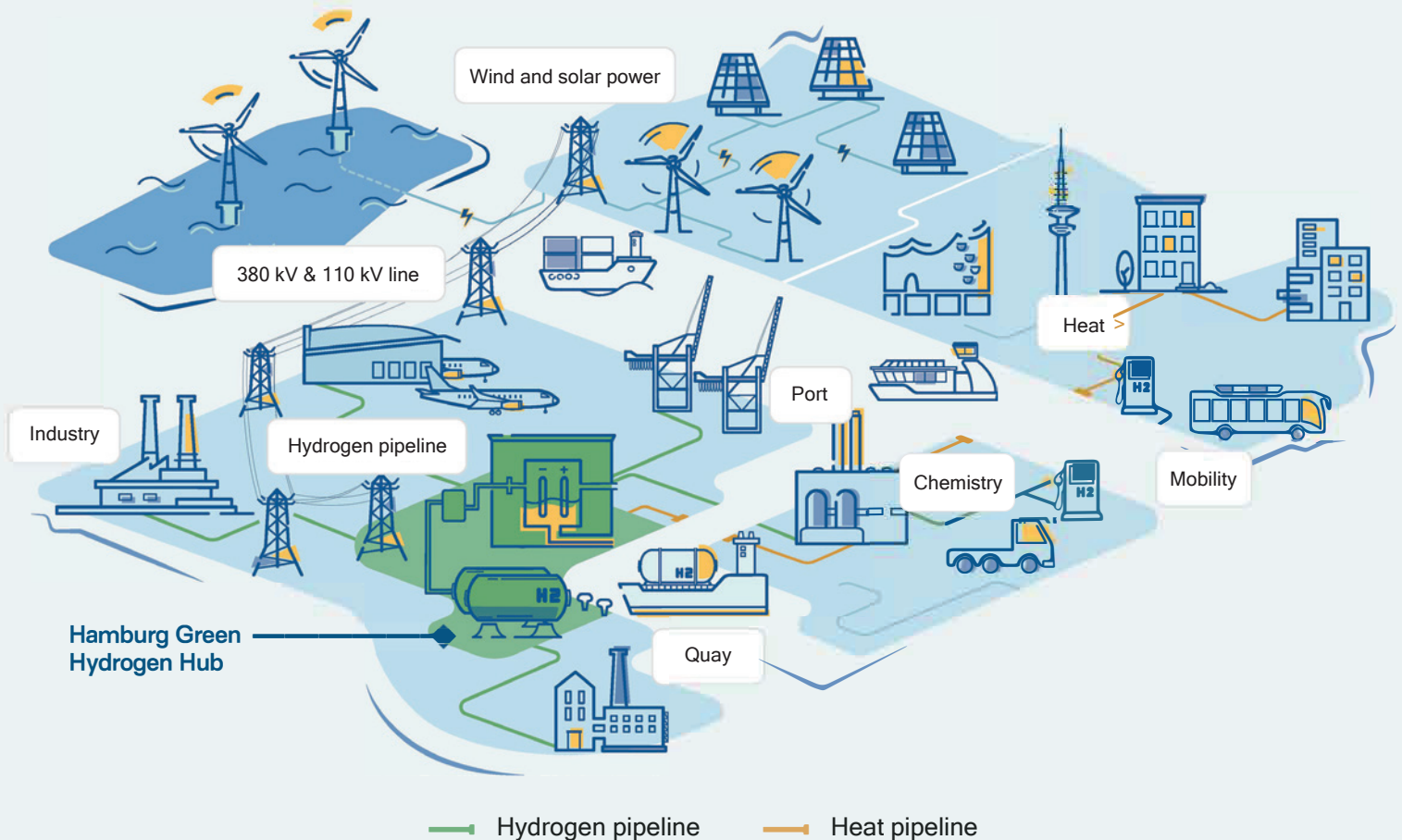
Learn more about
our electrolyzers

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Hamburg Green Hydrogen Hub

Hamburg has a passion for hydrogen. This is how we are decarbonising industry and mobility.



Moorburg has something other quarters of Hamburg don't have: a site where, in the not-so-distant past, coal was used to produce energy, will soon generate green hydrogen from renewable sources - and thus energy for mobility, heat, process gas or as a natural gas substitute. Because here, in the heart of Hamburg's port, we use wind and solar power to split water into hydrogen and oxygen in a large electrolyser. As one of the first projects worldwide, the project is aimed at decarbonising an entire port economy. Especially industry and transport have a high demand for zero-carbon energy in the form of hydrogen. Provided that the construction permit will be granted without delay, hydrogen production could start as early as 2025.



Networking events

Supporters of the hydrogen economy

In building the hydrogen economy, different stakeholders are working together at various levels of politics, science and business. As EEHH assists those involved with industry related questions and needs they may have and provides a platform for dialogue, the transformation continues to gain momentum. Below, eminent personalities from Hamburg share their perspectives on the hydrogen economy and its relevance.

© Ronald Sawatzki/Senatskanzlei Hamburg



“Hydrogen is a key energy carrier for the energy transition. Produced from renewable energies, it can substitute coal, oil and natural gas, while at the same time reducing climate-damaging emissions on a large scale. Hamburg aims to become the most prominent hydrogen location in the north, with sustainable production facilities and broad use in industry, business and transport.”

First Mayor of Hamburg
Dr Peter Tschentscher



“I believe that green hydrogen is not only a core element in decarbonising Hamburg’s economy and industry, and thus in achieving climate neutrality, but is also making a significant contribution to enhancing the competitive edge and the economic strength of Hamburg as a business location. The Hydrogen Economy cluster we have founded as part of the established and successful Renewable Energy Hamburg (EEHH) Cluster plays an essential role here. This joint platform allows hydrogen stakeholders from various industries, science, politics and administration to exchange ideas and strengthen collaboration.”

Michael Westhagemann
Minister for Economic Affairs, Transport and Innovation of Hamburg



© Daniel Reinhardt/Senatskanzlei Hamburg



© F. Besser



“Decarbonising industry, and the economy as a whole, will be a key lever for achieving our climate goals. In many places, green hydrogen is the solution for this. To master the energy transition, we have given the go-ahead for a hydrogen economy along the entire value chain.”

Jens Kerstan
Minister for the Environment, Climate, Energy and Agriculture of Hamburg



© Private



“Hydrogen was the very first element to be created in the universe after the Big Bang occurred, and today it is more relevant than ever. It can be used universally as a basic chemical substance as well as an energy carrier and storage medium. With the help of industrial innovation, we are leveraging hydrogen for the energy systems of the future.”

Hubert Grimm
Managing Director of Industrieverband Hamburg and physiochemist

”

“For Northern Germany, hydrogen is a key driver of innovation, and Hamburg has set the course for the successful development of a green hydrogen economy. Even at this stage, there are many innovative industry and research projects with high international appeal, and further projects are in the planning phases. Hamburg thus contributes to advancing decarbonisation at regional, national and international levels.”

Dr Michaela Ölschläger
Managing Director of the Hamburg Chamber of Commerce



© Private

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© VDI Hamburg



“Hydrogen is a secondary energy carrier that can be used universally and can be produced from electricity worldwide and in a climate-neutral manner – provided from renewable energies such as wind power and solar radiation. As a port and industrial city, Hamburg has the great opportunity to establish itself as a future import hub for ‘green’ hydrogen in Germany and to take on a leading role in this field.”

Professor Martin Kaltschmitt
Head of the Institute of Environmental Technology and Energy Economics
at the Hamburg University of Technology

”



Green hydrogen from Hamburg

Northern Germany's largest city is making extensive efforts to reduce dependencies on fossil fuels and minimise its CO₂ emissions. In view of climate change, the city needs to become cleaner and more sustainable – this is decided and is also laid down in Hamburg's climate protection plan. And stakeholders from business, academia and politics agree, that, hydrogen is the means of choice in order to facilitate a sustainable transformation process.

CLIMATE IMPACT AS A KEY FACTOR

Hamburg is famously home to Germany's biggest seaport, which forms a large inner-city industrial centre. And yet the Free and Hanseatic City of Hamburg owes its economic strength also to other key branches of the economy besides the maritime industries – such as the modern aviation industry or the basic and raw materials industries that produce steel, copper and aluminium – and the chemical industry is also well-represented here. Today, the future viability of these industries increasingly depends on their climate impact.

As the Hamburg Climate Protection Act stipulates that the city must become climate-neutral in the 2040s, local companies are required to use renewable energies – either in the form of green electricity or by using hydrogen as an energy carrier.

© Doublevision/Konstantin Beck



GREEN HYDROGEN FOR INDUSTRY

To be able to supply local industry with hydrogen, a consortium comprising Shell, Wärme Hamburg, Vattenfall and Mitsubishi Heavy Industries (MHI) is planning to build a 100 MW electrolyser at the site of the former coal-fired power plant in Moorburg, which was decommissioned in 2020. When the new facility goes into operation in 2025, it is expected to be the world's largest of its kind, with a production capacity of up to 30 tonnes of hydrogen daily. And this capacity will be scalable and could be more than doubled following several expansion stages. With only 60 km of new pipelines, the municipal hydrogen network could thus supply a large share of industrial companies with green hydrogen.

WindEnergy Hamburg

27 ——— 30
September 2022

windenergyhamburg.com

It's time
to put
Climate
First.

H₂INSIGHTS

**WindEnergy
Hamburg**
The global on & offshore event

H₂ will be the main topic at the world's leading trade fair for wind energy

- Green hydrogen: generation, storage, transport, use
- Project developers, investors and technology providers will be meeting there operators and buyers
- WindEnergyHamburg: 1,400 exhibitors and 35,000 visitors from over 100 countries

Organised by:



In cooperation with:



Global partner:



European partner:



Partners:



H₂ and its journey along the value chain

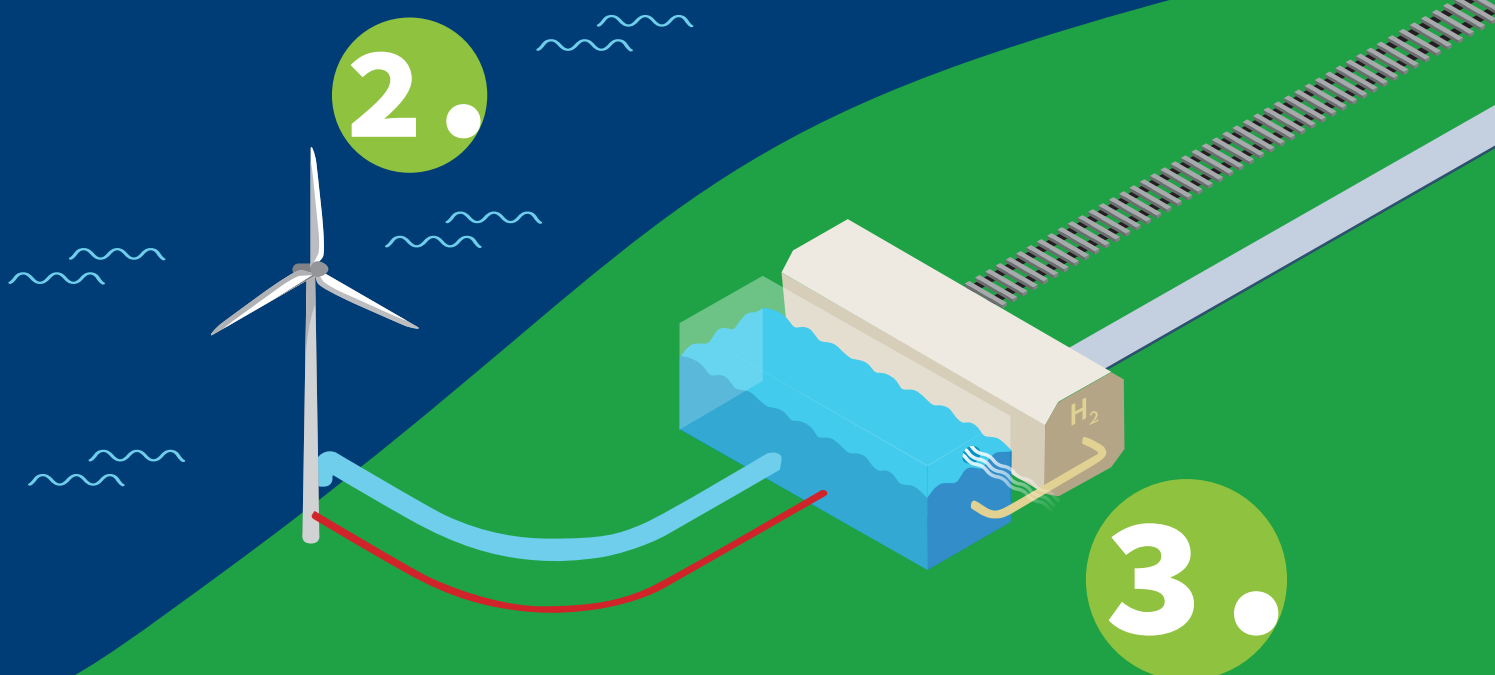
As a metropolitan region with unique locational advantages in terms of producing and storing renewable energies as well as huge potential for the use of hydrogen, especially by industry, Hamburg plays a crucial role in meeting national climate goals and mastering the energy transition. In addition, the port of Hamburg is an ideal logistics hub for importing and distributing green hydrogen across Germany and Europe.

1. THE ORIGINS: THE ELEMENT OF HYDROGEN ...

... is available in almost unlimited quantities on our planet, namely in the form of chemical compounds such as water, hydrocarbon and acids. The colourless and odourless gas does not serve as a source of energy, but as an energy carrier. Climate neutrality is achieved whenever hydrogen is produced from renewable energy sources.

2. WHEN IT COMES TO CLIMATE-NEUTRAL POWER GENERATION ...

... Hamburg scores points with its favourable location in the windy north and close to the coastal regions. Especially the power generated by wind and solar energy is used to supply private households and industry with electricity. However, under certain weather conditions – e.g. when there is a lot of wind and sun – there will be a surplus of electricity. And this surplus needs to be collected or stored without any delay if it is not to be lost. One option here is to feed it into an electrolysis plant to produce hydrogen.





4.

4. HYDROGEN REFUELLING AND PRODUCTION ...

... in the transport and industrial sectors can replace fossil fuels. In a fuel cell, for example, hydrogen is converted back into electricity and then used to supply energy to an electric motor.

5. AND HERE WE'VE COME FULL CIRCLE ...

... as water vapour is the only waste product to be released into the environment from hydrogen-powered vehicles and systems. That is, clean water is all that is returned to the cycle – without any further emissions.

5.

3. THE BASIS OF HAMBURG'S HYDROGEN INFRASTRUCTURE ...

... will be electrolyzers in the heart of the port. In such electrolyzers, water gets split into hydrogen and oxygen using electrical energy. This also produces a lot of waste heat which in turn can be used as an efficient means of heating buildings. Such on-site electrolysis is to be supplemented by imports via new pipelines and ships. The hydrogen will be transported within Hamburg to industrial consumers using a new pipeline network. To this end, the transport sector will be equipped with filling stations for hydrogen-powered ships, locomotives and other vehicles.

Hydrogen across different sectors of the economy

There are already numerous solutions and projects in Hamburg demonstrating how hydrogen can be used intelligently. Some of these are in the planning or implementation phases, while others have been in operation for some time. So let's have a look at Hamburg's key industries:

Raw materials and extractive industries: effective measure for carbon reduction

The production and refinement of metals and chemicals is particularly energy-intensive, and certain processes tend to require fossil fuels such as natural gas or coke. Replacing these with green hydrogen will be one of the most effective measures in decarbonising the local economy.

Example:

ArcelorMittal plant in Hamburg: The site is to produce steel in a climate-neutral manner by 2030. This includes the construction of a hydrogen-powered demonstration plant for the direct reduction of iron ore (H₂First) as well as the technological retrofitting of the existing direct reduction plant (H₂Ready) in order to replace the use of natural gas with green hydrogen in the long term.

Mobility and logistics: hydrogen for power generation

The use of hydrogen in mobility and logistics is especially relevant in the area of land-based heavy goods transport and local public transport. Since large vehicles such as lorries and buses are less suited to electrification than passenger cars, fuel cell technology plays a major role here, as it promises greater ranges and payloads. While it is up to the manufacturers and retrofitters to provide such vehicles, it will also be important to expand the relevant refuelling infrastructure.

Examples:

Stadtreinigung Hamburg: Trial operation of two truck-mounted sweepers and two refuse collection vehicles with fuel cell drives.

HOCHBAHN: Two fuel cell buses already in service, and a fleet of another 50 zero-emission buses is currently up for tender.

HADAG Seetouristik und Fährdienst AG: Procurement and operation of hydrogen-powered passenger ferries, use in public local transport.

Maritime industries: a dual role

When it comes to switching the economy from fossil fuels to hydrogen, the maritime industries have a dual role to play. In the medium term, propulsion systems need to be converted to accommodate fuel cells and synthetic fuels from hydrogen derivatives. Beyond this, however, shipping also constitutes an important part of the logistics chain for hydrogen transport.

Examples:

GreenPlug: With the "H₂ Push Boat" (H₂SB), the company has designed an emission-free push boat with a thrust capacity of 2,400 tonnes at a speed of 10 knots. The energy system consists of pressurised hydrogen storage tanks and fuel cells with buffer batteries that drive the ship's propellers via a direct current network.

Hamburger Hafen und Logistik AG (HHLA): Development and commissioning of industrial trucks (van carriers) with fuel cell drives.

Hamburg Port Authority: Provision of hydrogen fuelling stations for locomotives, ships and trucks; construction and deployment of hydrogen-powered ships.

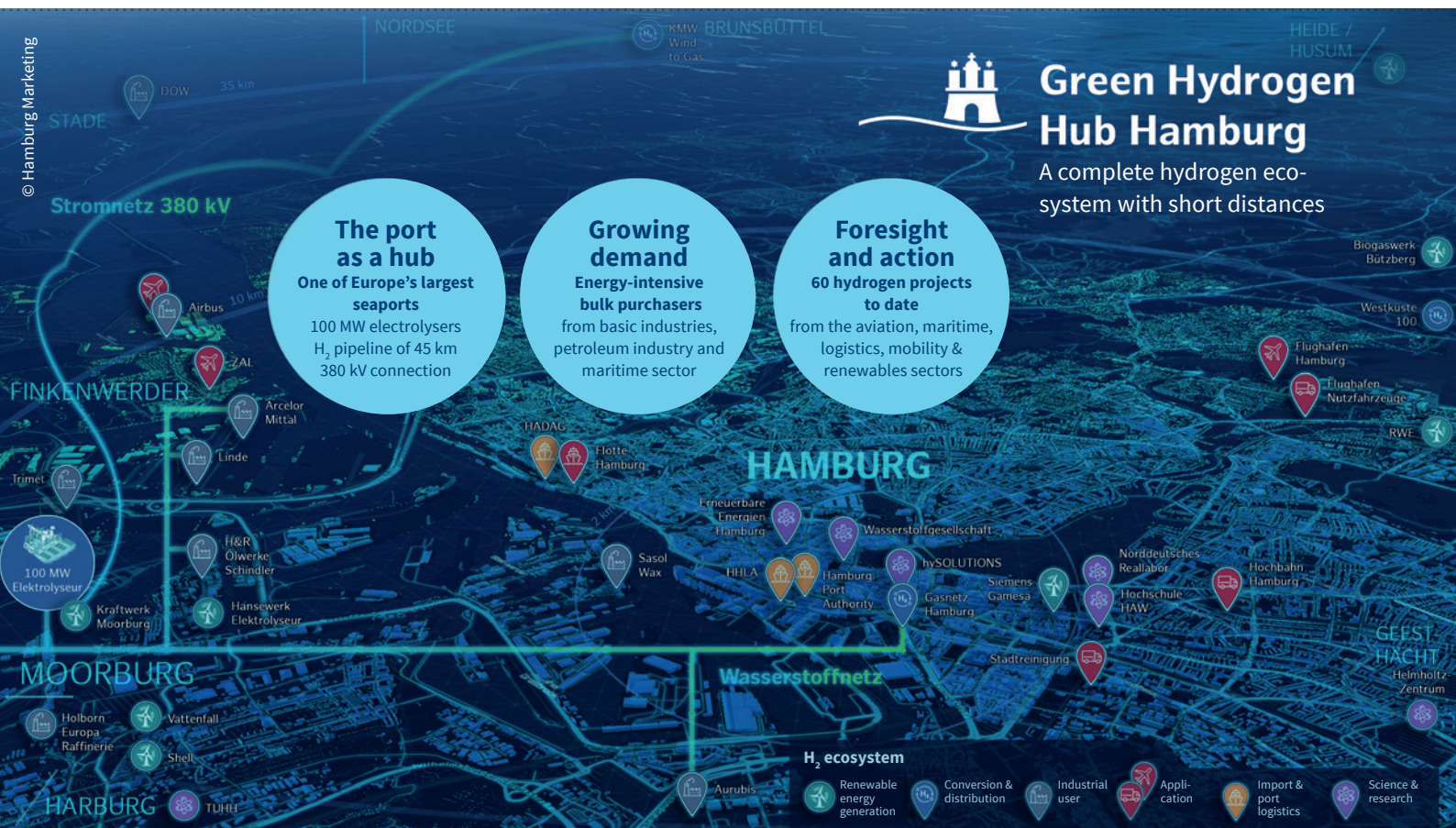
Aviation: a high-potential sector

Several years of development work are still needed before the first hydrogen-powered aircraft will be available. And yet the first decisive steps towards making aviation eco-friendlier have been initiated, ranging from climate-friendly aircraft production at the Airbus works to fuel cell-powered intralogistics and vehicle fleets at Hamburg Airport to PtL technologies for producing synthetic paraffin from hydrogen as a climate-neutral aircraft fuel.

Examples:

Hamburg Airport: Conversion of intralogistics vehicles to alternative drives, construction of an electrolyser to supply the company's own fleet of fuel cell vehicles.

Airbus: Decarbonising production sites in Northern Germany via hydrogen applications.

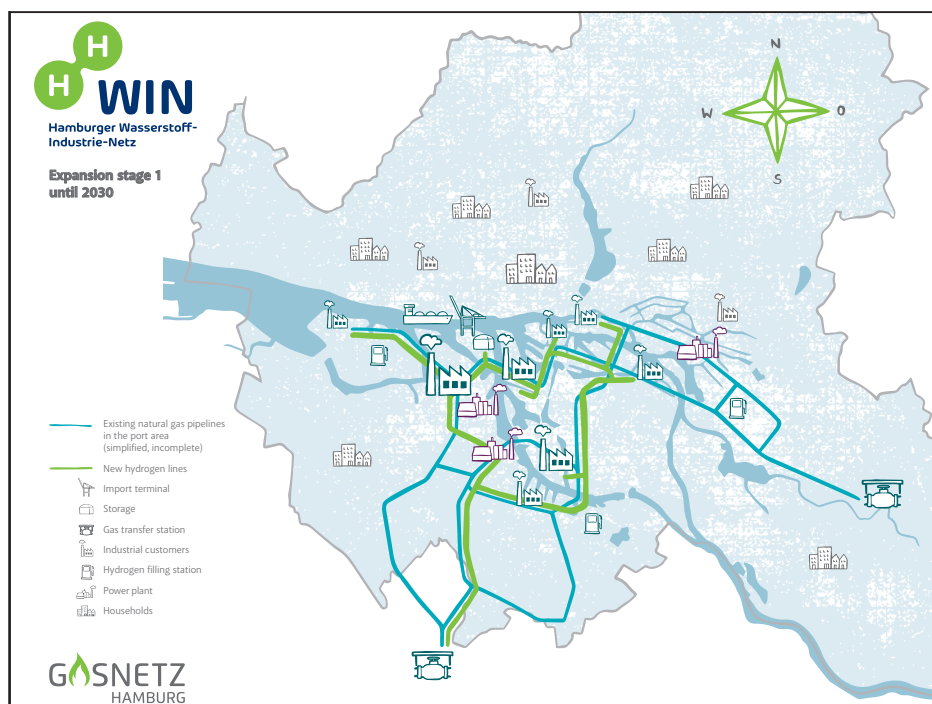


Customised H₂-systems for transport, storage and refuelling

Wystrachl
Customized solutions in high pressure



H₂ for the local economy: HH-WIN: Hamburg's hydrogen industry network



The Hamburg Hydrogen Industry Network (HH-WIN) is aimed at supplying Hamburg's industry with green hydrogen. By 2030, the 60-kilometre-long infrastructure will be able to provide a climate-neutral substitute for approx. one third of the natural gas currently consumed in Hamburg. In terms of climate protection, HH-WIN therefore has tremendous potential.

Only a few weeks after Gasnetz Hamburg presented its first plans for HH-WIN, the Hamburg Hydrogen Industry Network in the port, the local industry was so responsive that the planned pipeline was actually extended from 45 km to now 60 km. Today, more than a dozen of Hamburg's major industrial natural gas consumers have expressed interest in being supplied with and using green hydrogen – in addition to further partners from the Hamburg Hydrogen Network.

Projects from the neighbouring states of Lower Saxony and Schleswig-Holstein can also be connected to HH-WIN to feed green

hydrogen into the grid via long-distance pipelines and a transport ship berth. Moreover, Hamburg will be equipped with facilities such as a large-scale electrolyser, filling stations for hydro-gen-powered ships and vehicles as well as industrial applications – thus laying the foundation for Hamburg's hydrogen economy.

With the Hamburg Hydrogen Network, HH-WIN will serve as the connecting transport infrastructure for the entire H₂ value chain in Hamburg. Feeders, importers, consumers and filling stations are joining forces here to create a unique project. "HH-WIN will be realised over a period of only a few months, providing many companies with the option of reliable H₂ supplies by the mid-dle of the decade", says Christian Heine, Commercial Director at Gasnetz Hamburg. "This will allow Hamburg to become a model for other hydrogen regions – in Germany and in many other countries around the world."



The planned 100-megawatt electrolyser at the Moorburg site will be connected to HH-WIN as a feeder at an early stage.

The project will include routes in the port area south of the Elbe as well as additional connection facilities. Depending on the progress of realisation, existing natural gas pipelines are to be gradually converted for hydrogen use. By 2030, industrial companies representing 34 % of Hamburg's total natural gas consumption can be connected to HH-WIN, unleashing enormous potential in terms of climate protection. By substituting the current annual 6.4 terawatt hours (6.4 billion kilowatt hours) of natural gas with green hydrogen, Hamburg's total CO₂ emissions could be reduced by a total of 1.2 million tonnes per year.

Gasnetz Hamburg supports companies interested in joining the hydrogen economy. Thanks to its consulting expertise, it helps stakeholders achieve their climate goals as swiftly as possible. And for the operation of future hydrogen plants, Gasnetz Hamburg develops customised services aimed at making the use of H₂ for corporate customers just as easy as the use of traditional natural gas.

Up-to-date information on the Hamburg Hydrogen Industry Network is available on the website of Gasnetz Hamburg:

www.gasnetz-hamburg.de/hh-win



Energy transition alliance for sector coupling



In considerably reducing existing greenhouse gas emissions, we are facing the greatest and at the same time the most urgent challenge of our time. Today, 87 % of the greenhouse gases that are harmful to the climate are still attributable to the combustion of fossil fuels such as coal, oil and gas. If national climate protection goals are to be achieved and global warming is to be slowed down, all sectors of the economy will have to be decarbonised without delay.

NORTHERN GERMAN LIVING LAB

Funded by the Federal Ministry for Economic Affairs and Climate Action (BMWK), this joint project explores the transformation path for an integrated energy system over a wide area, with the aim of reducing CO₂ emissions in Northern Germany by 75 % by 2035. The project is backed by an energy transition alliance comprising 50 partners from business, science and politics. Over a period of five years (April 2021 to March 2026), numerous innovative sector coupling plants are being implemented to defossilise particularly energy-intensive areas of consumption step by step – especially in industry, but also in heat supply and in the mobility sector.

SECTOR COUPLING INITIATIVES

The following example from the Hamburg Hydrogen hub of the Northern German Living Lab illustrates how this takes shape in detail: the hub entails the testing of the material use of hydrogen (e.g. in the synthesis of chemical compounds or in the reduction of metals) and the energetic use (e.g. as an admixture to natural gas or as a substitute for natural gas or crude oil). The core element of the hub is a 25 MW electrolyser from HanseWerk AG, which produces green hydrogen for use on a large industrial scale. The hydrogen generated will be mainly used in a process plant of an industrial partner of the consortium. In addition, the Northern German Living Lab will also cater for the growing demand for hydrogen-based mobility in urban environments, and, in future, in other industrial processes too.

GENERATION CAPACITY

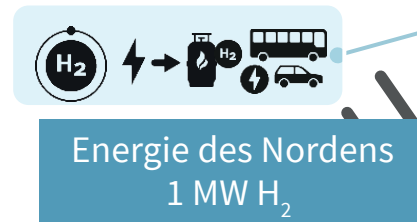
All in all, the Northern German Living Lab comprises eight electrolyzers with a hydrogen production capacity of 42 MW. In addition, three ventures are being implemented as part of the project that will facilitate industrial waste heat utilisation and storage for Hamburg's district heating system to the amount of 700 GWh per year. As regards the mobility sector, several hydrogen filling stations are being established in the context of the project, and more than 200 vehicles are being tested across different usage scenarios and vehicle classes.

PROVIDING STIMULI

The project's scalable innovations are to trigger economic stimuli that will strengthen Northern Germany as an industrial location and give companies a pioneering role in the international competition for climate protection technologies. The large-scale approach of the project, which incorporates broader cross-cutting issues from business and society alongside concrete test runs, makes the Northern German Living Lab a model for hydrogen-based sector coupling throughout Germany. As 350,000 to 500,000 tonnes of CO₂ emissions could be saved annually as part of the project, it promotes both economic prosperity and efficient climate protection.

Integrated sector coupling and hydrogen

25 projects including
18 demonstrators
(8 electrolyzers),
H₂ generation of 42 MW
Waste heat utilisation of
700 GWh in the overall
system network



Bremerhaven



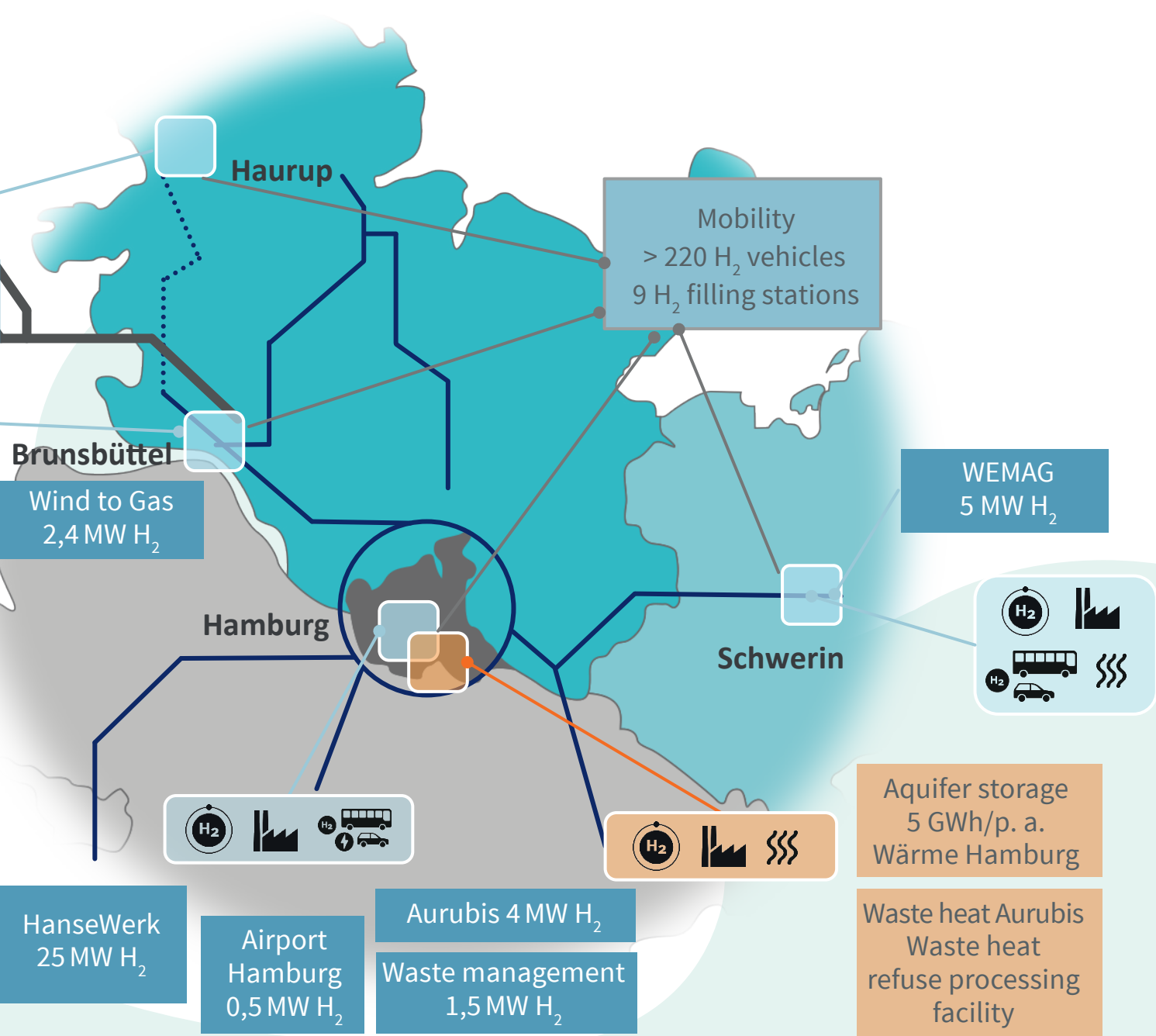
Fraunhofer IWES
2 x 1 MW H₂

Supporting your
hydrogen project



- Project development
- Feasibility checks
- Procurement and assessment of quotes
- (Technical) project management across all project phases
- Support in preparing and reviewing applications for funding

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0151 190 253 16 | info@grinix.de | www.grinix.de



Source: Northern German Living Lab



Power and heat from hydrogen

The HanseWerk Group operates a combined heat and power plant in Hamburg on a trial basis with up to 100% hydrogen from wind power. With this, we are protecting the climate and are setting the course for future operations with green hydrogen from pure hydrogen networks – for greener, safer, flexible and sustainable heat supply in urban environments.

More Energy. Less CO₂

Partner
for climate protection

Hanse
Werk



A further advantage:
Hamburg as a strong
research location



© Hereon/Christian Schmid

When it comes to ramping up the hydrogen economy and expanding renewable energies, research and development (R&D) plays an important role. To boost efficiency and competitiveness also in the long term, relevant technologies are being developed continuously. To achieve economies of scale and thus reduce cost, it is crucial to incorporate the experience gained in various processes of the hydrogen logistics chain. Our cluster network connects R&D stakeholders and helps establish links to companies, universities and research and funding institutions. By bringing experts together, innovative projects are initiated and promoted.

Research into H₂

A large number of renowned universities and institutes as well as corporate R&D activities make the Hamburg Metropolitan Region an important research location in the field of climate research and other disciplines. More recently, the hydrogen economy has also become increasingly relevant as a research domain. Here, the focus is placed e.g. on storage and drive systems for forms of mobility on water, on land and in the air, on the implementation of hydrogen in gas grids and heat supply as well as on advancing generation options further.

RESEARCH & HIGHER EDUCATION INSTITUTIONS FROM THE EEHH CLUSTER

- University of Hamburg (UHH)
- Hamburg University of Applied Sciences (HAW)
- Hamburg University of Technology (TUHH)
- Helmut Schmidt University
- HafenCity University Hamburg (HCU)
- Helmholtz-Zentrum Hereon GmbH
- Center of Applied Aeronautical Research (ZAL)

RENEWABLE ENERGY HAMBURG CLUSTER AGENCY

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